

## C L A I M S

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1. Method for providing a coating on the surfaces of a product with an open cell structure throughout its structure, **characterised in that** said coating is provided by means of a plasma polymerisation process.  
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2. Method according to claim 1, **characterised in that** said product with an open cell structure is degassed before performing the plasma polymerisation process.  
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3. Method according to claim 2, **characterised in that** the degassing is exerted by means of drying the open cell polymer in a drying kiln.  
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4. Method according to claim 2, **characterised in that** the degassing is exerted within the plasma polymerisation device.  
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5. Method according to claims 3 or 4, **characterised in that** said degassing is exerted by a temperature between 20 °C and 200 °C.  
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6. Method according to any one of claims 1 to 5, **characterised in that** the plasma polymer process is performed in a vacuum.  
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7. Method according to any one of claims, **characterised in that** in the plasma polymer process a monomer vapour is used.  
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8. Method according to claim 7, **characterised in that** said monomer vapour consists of a monomer or a mixture of monomers containing halogen and/or phosphor and/or nitrogen and/or silicon.  
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9. Method according to claim 8, **characterised in that** the monomer(s) result from precursor gas(es) or liquid(s) selected from fluor containing compounds

and/or phosphor containing compounds and/or silicon containing compounds and/or nitrogen containing compounds.

10. Method according to claim 9, **characterised in that** the monomer(s) result  
5 from precursor(s) selected from  $\text{CF}_4$ ,  $\text{C}_2\text{F}_6$ ,  $\text{C}_3\text{F}_6$ ,  $\text{C}_3\text{F}_8$ ,  $\text{C}_4\text{F}_8$ ,  $\text{C}_5\text{F}_{12}$  and/or  $\text{C}_6\text{F}_{14}$  or other saturated or unsaturated fluorcarbons ( $\text{C}_x\text{F}_y$ ) or hydrofluorcarbons.
11. Method according to claim 9, **characterised in that** the monomer(s) result  
10 from precursor(s) selected from trimethylphosphate, triethylphosphate, tripropylphosphate or other derivates of phosphoric acid.
12. Method according to claim 9, **characterised in that** the monomer(s) result  
15 from precursor(s) selected from ethylamine, triethylamine, allylamine or acrylonitrile.
13. Method according to any one of the preceding claims, **characterised in that** said product with an open cell structure is an open cell polymer.
- 20 14. Method according to claim 13, **characterised in that** said open cell polymer is a polyurethane, a polyethylene, a melamine or a polystyrene foam.
15. Method according to any one of the claims 1 to 12, **characterised in that** said  
25 product with an open cell structure is a sintered open-cell reticulated/foam-like structure.
16. Method according to claim 15, **characterised in that** said sintered open-cell reticulated/foam-like structures are made out of pure metals, alloys or ceramics.
- 30 17. Method according to any one of the claims 1 to 12, **characterised in that** open cell structure is a semi-open celled foam.

18. Method according to claim 17, **characterised in that** said semi-open celled foam is an urethane, a polyethylene or a polystyrene semi-open celled foam.
- 5 19. Use of a method according to any one of the preceding claims with the goal to obtain a hydrophobe, oleophobe, flame retardant and/or barrier coating on the surfaces of an open cell polymer throughout its polymer structure.